

## CLAIMS

1. A method of performing link quality estimation of a TDMA-based wireless communication link between a mobile station (10) and a target base station (16a-c), wherein the mobile station (10) receives a signal on a channel frequency of the target base station (16a-c),  
characterised by the following steps:
  - measuring by the mobile station (10) a link quality of the received signal,
  - simultaneously identifying the target base station (16a-c) based on the same received signal, and
  - qualifying the measurement if the mobile station (10) has succeeded to identify the target base station (16a-c), or
  - discarding the measurement if the mobile station (10) has failed to identify the target base station (16a-c).
2. A method according to claim 1, wherein the mobile station (10) is connected to a serving base station (14) and the target base station (16a-c) is a neighbouring base station, characterised by the further step of reporting the qualified measurement by the mobile station (10) to the serving base station (14).
3. A method according to claim 2, characterised in that the mobile station (10) is directed by the serving base station (14) in a measurement order to select a measuring and identifying scheme for performing the steps of measuring and identifying, wherein the scheme is pre-programmed in the mobile station (10).

4. A method according to any of claims 1 - 3, **characterised**  
in that the received signal is measured with respect to  
at least one of: received signal strength (RSS), carrier-  
to-interference power ratio (C/I), carrier power, and bit  
error rate (BER).
5. A method according to any of claims 1 - 4, **characterised**  
in that the received signal includes an identity of the  
target base station (16a-c) which is detected by the  
mobile station (10).
6. A method according to claim 5, **characterised in** that the  
received signal includes a synchronisation channel burst  
from the target base station (16a-c) including the  
identity.
7. A method according to any of claims 1 - 4, wherein the  
received signal includes a burst from the target base  
station (16a-c) including a training sequence,  
**characterised in** that the identifying step includes the  
substeps of:
- estimating the training sequence by the mobile station  
(10), wherein the training sequence is related to an  
identity of the target base station (16a-c) in a way that  
is known by the mobile station (10), and
  - deriving the target base station identity from the  
estimated training sequence based on the known relation.
8. A method according to claim 7, **characterised in** that a  
code of the training sequence is identical to the  
identity of the target base station (16a-c).

9. A method according to any of claims 1 - 8, characterised in that the identifying step includes attempting to detect the received signal using at least two different modulation forms.

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10. A method according to any of claims 1 - 9, characterised in that the received signal includes a dummy burst including an identity of the target base station (16a-c).

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11. A method according to claim 7 or 8, characterised in that the burst from the target base station (16a-c) is a dummy burst including the training sequence being related to the identity of the target base station (16a-c).

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12. A method according to any of claims 1 - 4 and 7 - 11, characterised in that channel estimation is conducted on the received signal with respect to the target base station (16a-c) for performing at least one of the measuring and identifying steps.

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13. A method according to claim 12, wherein one or more channel estimates are derived from the received signal, characterised in that identifying step includes the substeps of:

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- determining the channel estimates for a set of pre-determined training sequences,
- calculating a selection metric, and
- selecting the training sequence that yields the greatest selection metric.

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14. A method according to any of claims 1 - 13, wherein the target base station (16a-c) is unsynchronised with the

mobile station (10), characterised in that the mobile station (10) receives a burst of a synchronisation channel for obtaining timing information, wherein the identifying step is based on the obtained timing information.

15.A method according to any of claims 1 - 14, characterised in that the received signal includes a complete burst period.

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16.A method according to claim 12, wherein the received signal includes contributions from a plurality of unsynchronised target base stations transmitting on the same frequency channel, characterised in that the steps of measuring and identifying are performed with respect to one target base station at a time sequentially for at least two of the target base stations.

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17.A method according to claim 12, wherein the received signal includes contributions from a plurality of synchronised target base stations transmitting on the same frequency channel, characterised in that the steps of measuring and identifying are performed with respect to the target base stations for at least two of the synchronised target base stations jointly in one operation.

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18.A method according to any of claims 1 - 17, characterised in that the qualified measurement is used for at least one of: performing base station selection for serving the mobile station (10) in idle or busy mode, estimating cell

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relations and determining the position of the mobile station (10).

19. A mobile station (10) including means for receiving a  
5 signal on a channel frequency of a target base station  
(16a-c) for performing link quality estimation of a TDMA-  
based wireless communication link with the target base  
station (16a-c), **characterised in** that the mobile station  
(10) further includes:

- 10 - means for measuring a link quality of the received  
signal,
- means for identifying the target base station (16a-c)  
simultaneously based on the same received signal, and
- means for qualifying the measurement if the mobile  
15 station (10) has succeeded to identify the target base  
station (16a-c) or discarding the measurement if the  
mobile station (10) has failed to identify the target  
base station (16a-c).

20. A mobile station (10) according to claim 19, wherein the  
20 mobile station (10) is connected to a serving base  
station (14) and the target base station (16a-c) is a  
neighbouring base station, **characterised in** that the  
mobile station (10) further includes means for reporting  
25 the qualified measurement by the mobile station (10) to  
the serving base station (14).

21. A mobile station (10) according to claim 20,  
30 **characterised in** that the mobile station (10) further  
includes at least one pre-programmed measuring and  
identifying scheme, wherein the mobile station (10) is  
directed by the serving base station (14) in a

measurement order to select a measuring and identifying scheme.

22.A mobile station (10) according to any of claims 19 - 21,  
5     **characterised in** that the measuring means measures the received signal with respect to at least one of: received signal strength (RSS), carrier-to-interference power ratio (C/I), carrier power and bit error rate (BER).

10   23.A mobile station (10) according to any of claims 19 - 22,  
     **characterised in** that the identifying means detects an identity of the target base station (16a-c) included in the received signal.

15   24.A mobile station (10) according to any of claims 19 - 22,  
     **characterised in** that the identifying means estimates a training sequence included in the received signal, wherein the training sequence is related to an identity of the target base station (16a-c) in a way that is known  
20   by the mobile station (10), and that the identifying means further derives the identity from the estimated training sequence based on the known relation.

25   25.A mobile station (10) according to any of claims 19 - 24,  
     **characterised in** that the identifying means attempts to detect the received signal using at least two different modulation forms.

30   26.A mobile station (10) according to any of claims 19 - 22, 24 and 25, **characterised in** that the mobile station (10) further includes means for conducting channel estimation on the received signal with respect to the target base

station (16a-c), which is used for measuring and identifying.

27. A mobile station (10) according to claim 26, wherein one  
5 or more channel estimates are derived from the received  
signal, characterised in that the mobile station (10)  
further includes:

- means for determining the channel estimates for a set of  
pre-determined training sequences,
- 10 - means for calculating a selection metric, and
- means for selecting the training sequence that yields the  
greatest selection metric.

28. A mobile station (10) according to any of claims 19 - 27,  
15 wherein the target base station (16a-c) is unsynchronised  
with the mobile station (10), characterised in that the  
mobile station (10) further includes means for receiving  
a burst of a synchronisation channel for obtaining timing  
information, wherein the identifying means uses the  
20 obtained timing information.

29. A mobile station (10) according to claim 26, wherein the  
received signal includes contributions from a plurality  
of unsynchronised target base stations transmitting on  
the same frequency channel, characterised in that the  
25 measuring and identifying means measures and identifies  
with respect to one target base station at a time  
sequentially for at least two of the target base  
stations.

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30. A mobile station (10) according to claim 26, wherein the  
received signal includes contributions from a plurality

of synchronised target base stations transmitting on the same frequency channel, characterised in that the measuring and identifying means measures and identifies jointly with respect to the target base stations for at least two of the synchronised target base stations in one operation.

31.A mobile station (10) according to any of claims 19 - 30, characterised in that the mobile station (10) further includes means for performing base station selection based on the measurement results.

32.A computer program product directly loadable into the internal memory of a computer in the mobile station (10), including software code means for performing the method according to any of claims 1-18.

33.A computer program product stored on a computer usable medium, including readable program for causing a computer in the mobile station (10) to perform the method according to any of claims 1-18.